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NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

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imagery analysis report

Development of Soviet Aerodynamic Cruise Vehicle—ADV-2 (S)

Top Secret

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IAR-0176/80

NOVEMBER 1980

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DEVELOPMENT OF SOVIET AERODYNAMIC CRUISE VEHICLE—ADV-2 (S)

INTRODUCTION

1. (S/D) This report provides an analysis of the ground-launched aerodynamic vehicle, designated ADV-2, currently undergoing tests in the Soviet Union. Three versions of the ADV-2 have been identified on imagery, as well as several support vehicles related to this system. The ADV-2 and these associated support vehicles have been observed at Kapustin Yar Cruise Test Complex D, Site 1 [redacted] Figure 1), at Akhtubinsk Flight Test Center (FTC, [redacted] 25X1
[redacted] and at Ramenskoye FTC [redacted] Figure 2). A [redacted] airframe, recently 25X1(1
observed on a BACKFIRE B aircraft at Akhtubinsk FTC, and its possible association with the ADV-2 are also discussed in this report.

2. (S/D) This report contains two location maps, three conceptual drawings, and 15 annotated photographs.

DESCRIPTION

3. (S/D) The ADV-2 is a ground-launched, air-breathing, aerodynamic cruise vehicle currently undergoing flight testing at Kapustin Yar. Three versions of the ADV-2 (ADV-2a, -2b, and -2c) have been identified at Kapustin Yar. All three have a [redacted] fuselage with a dorsal-mounted air 25X1
intake positioned ahead of the main wings and a single vertical stabilizer. The three vehicles differ from each other primarily in the design and location of the various control/lifting surfaces .

ADV-2a

4. (S/D) The ADV-2a (Figure 3), which was first observed on imagery of [redacted] 25X1
has control/lifting surfaces that consist of aft-mounted, clipped delta wings and two sets of foreplanes which have sharply tapered leading and trailing edges with rounded wingtips.

ADV-2b

5. (S/D) The ADV-2b (Figure 4) was first observed on [redacted] and has aft- 25X1
mounted, clipped delta wings and a single set of foreplanes that have straight leading and trailing edges with squared wingtips.

ADV-2c

6. (S/D) The ADV-2c (Figure 5), which had been tentatively identified as the ADV-3 on [redacted] 25X1
[redacted] has a single set of foreplanes similar in appearance to those of the ADV-2b; however, 25X1
the wings of the ADV-2c are a simple delta design and are not the clipped delta observed on the other two versions.

[redacted] 25X1

25X1

25X1

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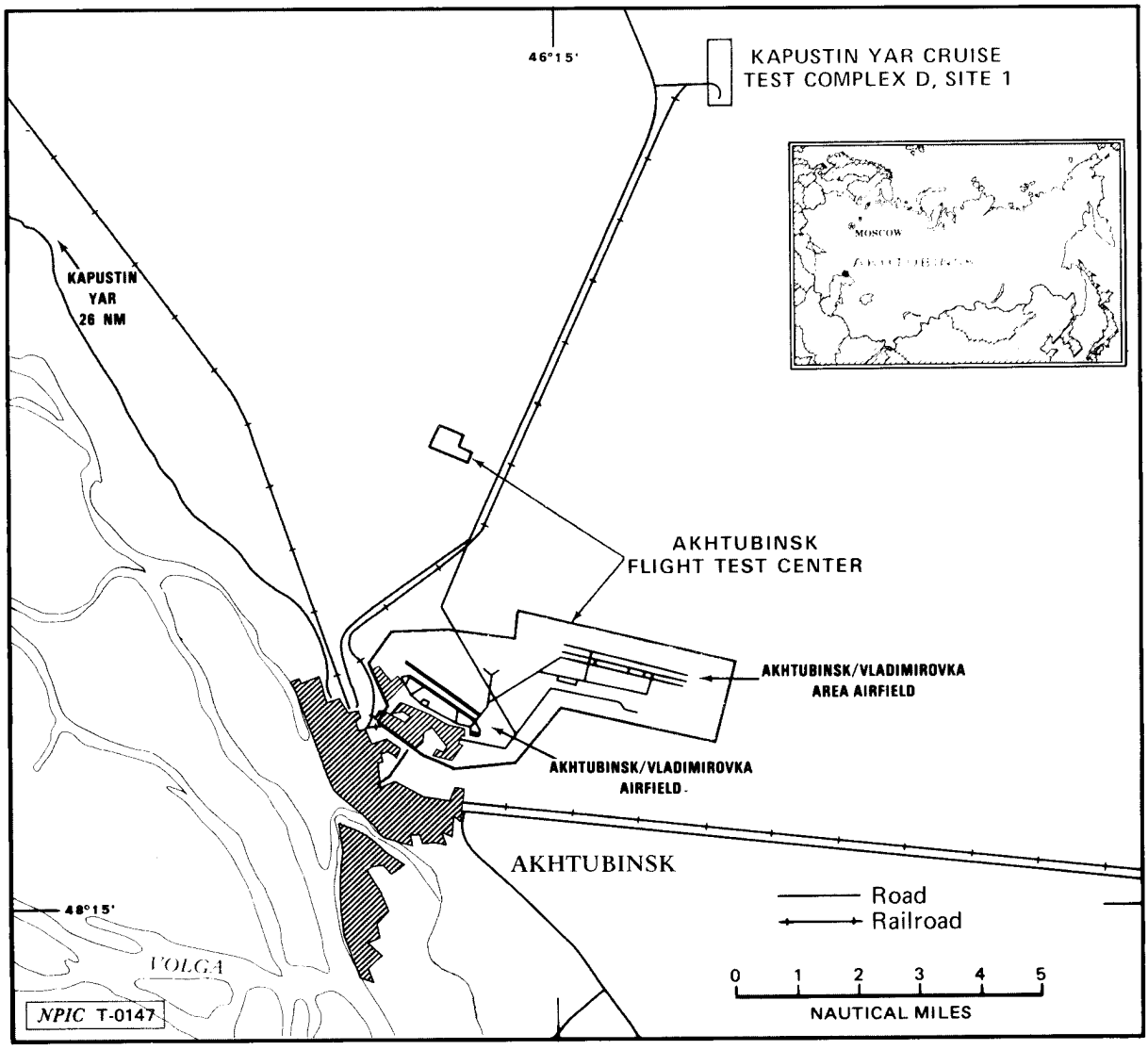


FIGURE 1. LOCATIONS OF AKHTUBINSK FLIGHT TEST CENTER AND KAPUSTIN YAR CRUISE TEST COMPLEX D, SITE 1, USSR

25X1

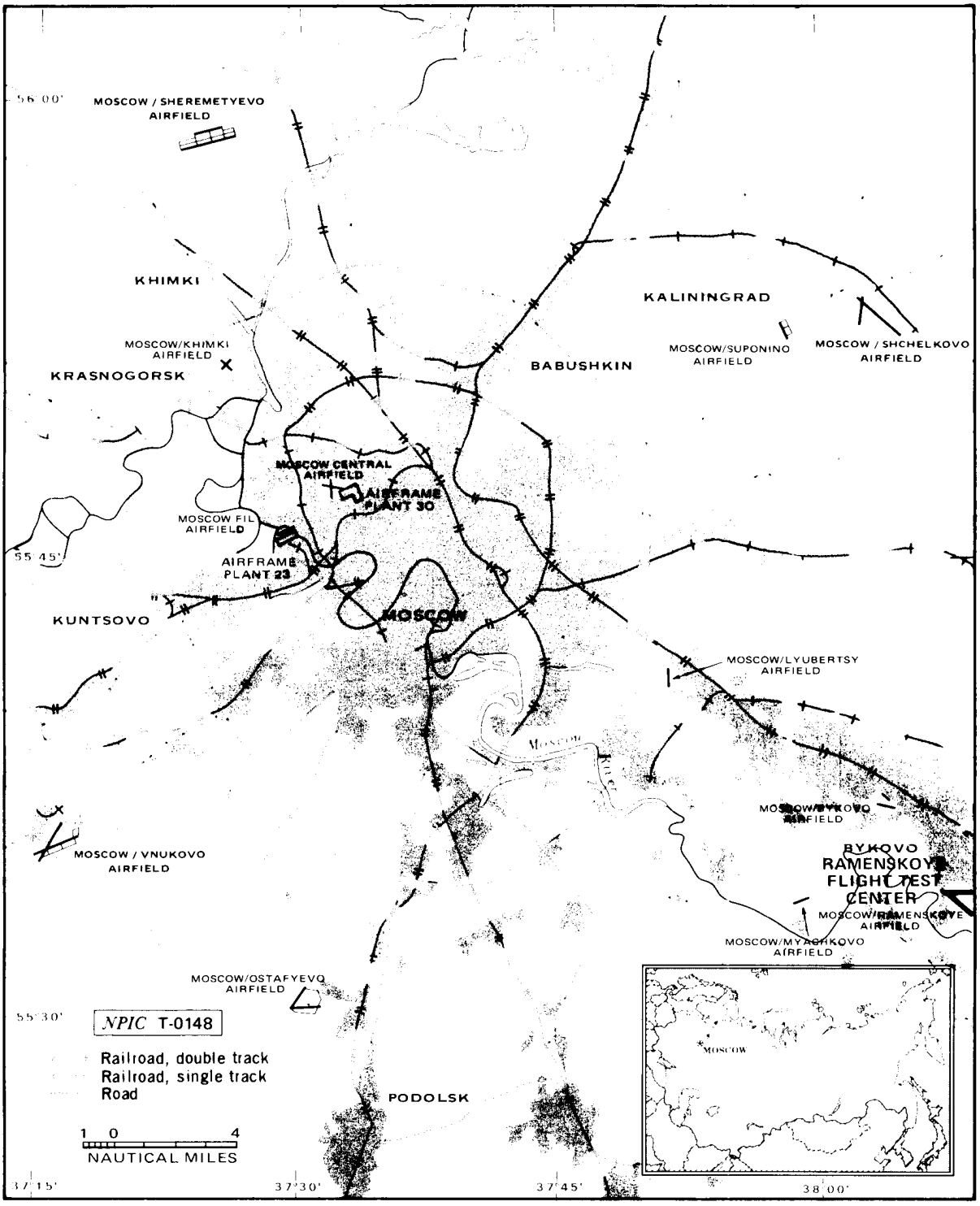
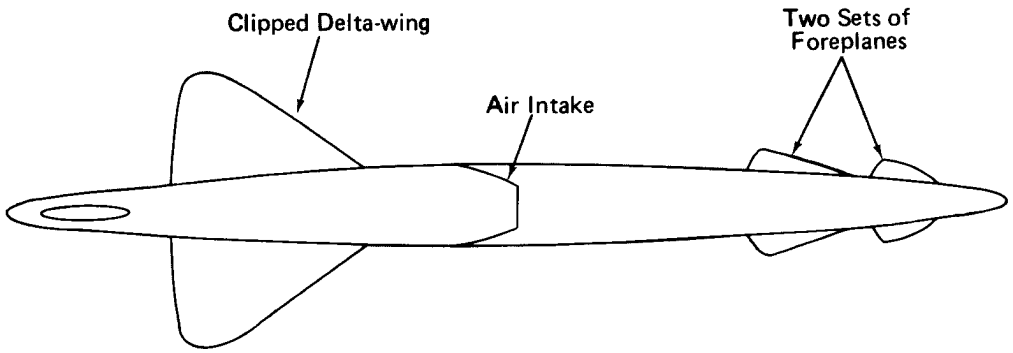


FIGURE 2. LOCATION OF RAMENSKOYE FLIGHT TEST CENTER, USSR

 25X1



ADV-2a	
Length (overall)	
Max fuselage diam	
Wing span	
Nose-to-wing leading edge	
Wing root chord	

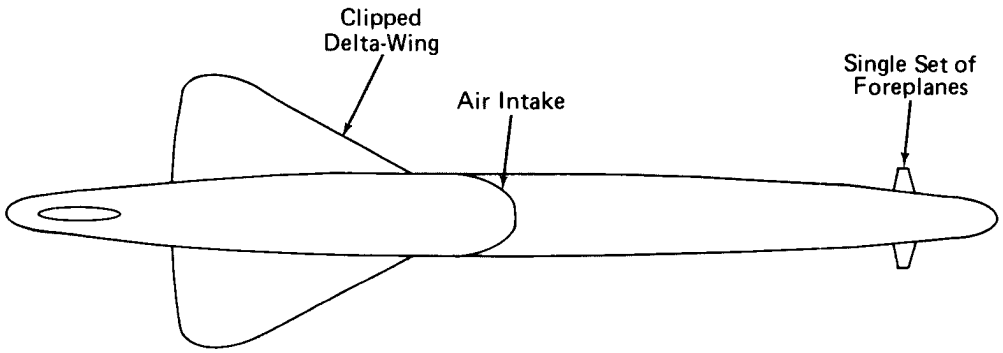
25X1

25X1

[redacted]

FIGURE 3. ADV-2a ON LAUNCHER, KAPUSTIN YAR CRUISE TEST COMPLEX D, SITE 1

25X1



ADV-2b

Length (overall)	
Max fuselage diam	
Wing span	
Nose-to-wing leading edge	
Wing root chord	

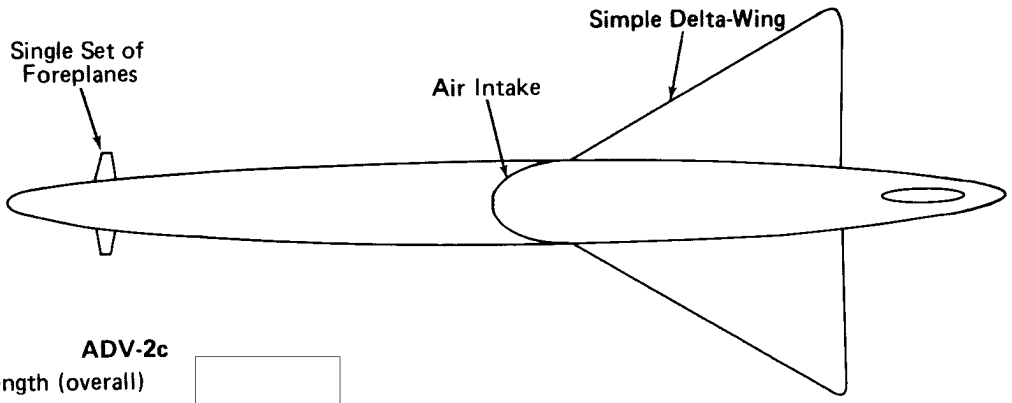
25X1

25X1

FIGURE 4. ADV-2b ON LAUNCHER, KAPUSTIN YAR CRUISE TEST COMPLEX D, SITE 1

25X1

25X1



ADV-2c

Length (overall)	
Max fuselage diam	
Wing span	
Nose-to-wing leading edge	
Wing root chord	

25X1

25X1

FIGURE 5. ADV-2c ON LAUNCHER, KAPUSTIN YAR CRUISE TEST COMPLEX D, SITE 1

25X1

8. (S/D) In addition to the three versions of the ADV-2, several support vehicles associated with this program have been identified.

ADV-2 Launcher

9. (S/D) The ADV-2 launcher (Figure 6) is a [redacted]-long, double-axle trailer of unusual appearance. A raised cradle on which an ADV-2 would be placed is centerline mounted on the trailer and is [redacted] No blast shield/deflector was observed on the launcher. 25X1 25X1

ADV-2 Transporter

10. (S/D) The ADV-2 transporter (Figure 7) is also a [redacted] double-axle trailer which is usually observed canvas covered. The canvas is draped over a light framework which gives this vehicle a ribbed appearance. This transporter has often been attached to a KRAZ-214/-255 prime mover. 25X1

ADV-2 Checkout Van/Trailer

11. (S/D) A [redacted] van/trailer (Figure 8), probably used for avionics/guidance system checkout of the ADV-2, has also been identified. This chamfer-roofed van/trailer has eight vents, four along each side of the chamfer roof, and two boxlike protrusions, one on the aft portion of the roof and one on the front of the van/trailer. A KRAZ-214/-255 prime mover has usually been observed attached to the van/trailer. 25X1

Historical Development

12. (S/D) The earliest evidence of the ADV-2 program was provided on imagery of [redacted] of Ramenskoye FTC. An ADV-2 transporter and an ADV-2 checkout van/trailer (Figure 9) were at the southeast end of the Tupolev area on those dates. The first observation of ADV-2-associated equipment at Kapustin Yar occurred on [redacted] when an ADV-2 transporter was south of launch pad D-3. A possible ADV-2 transporter was also at the air-to-surface missile (ASM) support facility of Akhtubinsk FTC on [redacted] 25X1 25X1 25X1 25X1

13. (S/D) The first observation of an actual ADV-2 (a probable ADV-2a) on an ADV-2 launcher occurred on [redacted] at Kapustin Yar. The ADV-2a and launcher were on launch pad D-3 and, with few exceptions, have usually been observed there since. 25X1

14. (S/D) Although an ADV-2 checkout van/trailer was at Ramenskoye as early as 1974 and two such vehicles were observed there on [redacted], no ADV-2 checkout van/trailer was observed at Kapustin Yar until [redacted] an RSBN-4N, a Soviet short-range navigational aid, was first observed at Kapustin Yar. The RSBN-4N has been present on all subsequent coverages of Kapustin Yar (Figure 10). 25X1 25X1

15. (S/D) A second, canvas-covered ADV-2 launcher was first observed at Ramenskoye FTC on [redacted] The launcher and an ADV-2 transporter were observed in the Tupolev area through [redacted] (Figure 11). A second launcher and a second ADV-2 transporter were subsequently observed at Kapustin Yar on [redacted] The second launcher remained canvas covered and parked south of and adjacent to the first ADV-2 launcher through [redacted] [redacted] (Figure 12). 25X1 25X1 25X1 25X1 25X1

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16. (S/D) A second cruise vehicle, the ADV-2b, was observed for the first time on at Kapustin Yar. The ADV-2b was on the second ADV-2 launcher, which had been moved to its firing position on the northeast end of the launch pad. An ADV-2b was subsequently observed there throughout the remainder of 1979 and early 1980. Only one ADV-2 transporter was observed at Kapustin Yar on However, same-day coverage of the ASM support facility at Akhtubinsk FTC revealed the presence of an ADV-2 transporter. An ADV-2 transporter was observed at Akhtubinsk on several subsequent coverages until

17. airframe was observed on a BACKFIRE B in the Tupolev area of Ramenskoye FTC. The airframe was mounted under the port wing of the BACKFIRE, but no control/lifting surfaces could be identified.

The BACKFIRE B with the airframe and an ADV-2 checkout van/trailer may have been at Akhtubinsk as early as however, this could not be confirmed due to the poor interpretability of the imagery. On an ADV-2 checkout van/trailer was adjacent to the airframe at Akhtubinsk. The airframe was observed repeatedly at Akhtubinsk (Figure 14), where it was undergoing captive flight testing until .

18. (S/D) At Kapustin Yar, the ADV-2c was first identified on It was observed on the ADV-2 launcher previously used for the ADV-2b. The last confirmed observation of an ADV-2c was on

19. (S/D) During June 1980, the transfer of ADV-2 equipment from Akhtubinsk FTC to Ramenskoye FTC was observed. Two missile railcars were observed at Akhtubinsk/Vladimirovka ASM Support Facility Complex of Akhtubinsk FTC on One of the railcars was observed with an empty, extended transfer tray (Figure 15). In addition, a probable ADV-2 transporter was adjacent to the new five-bay hangar at Akhtubinsk. A special-purpose train was observed on a rail siding at Akhtubinsk (Figure 16) on components of the train included two missile railcars and several flatcars, two of which carried ADV-2 checkout van/trailers. Two missile railcars and two ADV-2 checkout van/trailers were in the Tupolev area of Ramenskoye FTC on In addition, a BACKFIRE B with the airframe was also present. One of the two missile railcars was observed with a probable ADV-2 on the extended transfer tray (Figure 17) on

IMAGERY ANALYST'S COMMENTS

20. (S/D) The intended role of the ADV-2 is still unclear. This ground-launched vehicle could be used as a reconnaissance drone, an electronics countermeasure drone, or a cruise missile. However, an apparent correlation exists between the ground-launched ADV-2 and the airborne, BACKFIRE-mounted airframe. The association of the ADV-2 checkout van/trailer with the airframe, as well as the identification of similar navigational systems for both this airframe and the ADV-2, suggests the correlation. It is possible that ADV-2-related technology or the ADV-2 itself is being used in an air-launched cruise vehicle program.

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[redacted] 25X1

REFERENCES

IMAGERY

(TSR) All available KEYHOLE imagery acquired between [redacted] 25X1
[redacted] the information cutoff date, was used in the preparation of this report. 25X1

MAPS OR CHARTS

DMAAC. US Air Target Chart, Series 200, Sheets 0235-22 and 0167-5, scale 1:200,000 (UNCLASSIFIED)

DOCUMENT

1. DIA. Defense Intelligence Notice 192-1C, *USSR: Aerodynamic Cruise Vehicle Development*, 10 Jul 80 (TOP SECRET R-[redacted] 25X1

(S) Comments and queries regarding this report are welcome. They may be directed to [redacted] 25X1
Warsaw Pact Forces Division, Imagery Exploitation Group [redacted] 25X1

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